



## SEQUENCE LISTING

&lt;110&gt; MILBURN, MICHAEL V.

&lt;120&gt; PDE5A CRYSTAL STRUCTURE AND USES

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&lt;140&gt; 10/771,833

&lt;141&gt; 2004-02-03

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&lt;150&gt; 60/444,734

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&lt;170&gt; PatentIn Ver. 3.2

&lt;210&gt; 1

&lt;211&gt; 875

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 1

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Pro Gln Gln Gln Lys Gln Gln Gln Arg Asp Gln Asp Ser Val Glu Ala  
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Trp Leu Asp Asp His Trp Asp Phe Thr Phe Ser Tyr Phe Val Arg Lys  
35 40 45

Ala Thr Arg Glu Met Val Asn Ala Trp Phe Ala Glu Arg Val His Thr  
50 55 60

Ile Pro Val Cys Lys Glu Gly Ile Arg Gly His Thr Glu Ser Cys Ser  
65 70 75 80

Cys Pro Leu Gln Gln Ser Pro Arg Ala Asp Asn Ser Val Pro Gly Thr  
85 90 95

Pro Thr Arg Lys Ile Ser Ala Ser Glu Phe Asp Arg Pro Leu Arg Pro  
100 105 110

Ile Val Val Lys Asp Ser Glu Gly Thr Val Ser Phe Leu Ser Asp Ser  
115 120 125

Glu Lys Lys Glu Gln Met Pro Leu Thr Pro Pro Arg Phe Asp His Asp  
130 135 140

Glu Gly Asp Gln Cys Ser Arg Leu Leu Glu Leu Val Lys Asp Ile Ser  
145 150 155 160

Ser His Leu Asp Val Thr Ala Leu Cys His Lys Ile Phe Leu His Ile  
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 His Gly Leu Ile Ser Ala Asp Arg Tyr Ser Leu Phe Leu Val Cys Glu  
 180 185 190  
 Asp Ser Ser Asn Asp Lys Phe Leu Ile Ser Arg Leu Phe Asp Val Ala  
 195 200 205  
 Glu Gly Ser Thr Leu Glu Glu Val Ser Asn Asn Cys Ile Arg Leu Glu  
 210 215 220  
 Trp Asn Lys Gly Ile Val Gly His Val Ala Ala Leu Gly Glu Pro Leu  
 225 230 235 240  
 Asn Ile Lys Asp Ala Tyr Glu Asp Pro Arg Phe Asn Ala Glu Val Asp  
 245 250 255  
 Gln Ile Thr Gly Tyr Lys Thr Gln Ser Ile Leu Cys Met Pro Ile Lys  
 260 265 270  
 Asn His Arg Glu Glu Val Val Gly Val Ala Gln Ala Ile Asn Lys Lys  
 275 280 285  
 Ser Gly Asn Gly Gly Thr Phe Thr Glu Lys Asp Glu Lys Asp Phe Ala  
 290 295 300  
 Ala Tyr Leu Ala Phe Cys Gly Ile Val Leu His Asn Ala Gln Leu Tyr  
 305 310 315 320  
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 Lys Ile Ala Ala Thr Ile Ile Ser Phe Met Gln Val Gln Lys Cys Thr  
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 His Met Glu Cys Glu Glu Leu Glu Lys Ser Ser Asp Thr Leu Thr Arg  
 385 390 395 400  
 Glu His Asp Ala Asn Lys Ile Asn Tyr Met Tyr Ala Gln Tyr Val Lys  
 405 410 415  
 Asn Thr Met Glu Pro Leu Asn Ile Pro Asp Val Ser Lys Asp Lys Arg  
 420 425 430  
 Phe Pro Trp Thr Thr Glu Asn Thr Gly Asn Val Asn Gln Gln Cys Ile  
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 Arg Ser Leu Leu Cys Thr Pro Ile Lys Asn Gly Lys Lys Asn Lys Val  
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Ile Gly Val Cys Gln Leu Val Asn Lys Met Glu Glu Asn Thr Gly Lys  
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 Val Lys Pro Phe Asn Arg Asn Asp Glu Gln Phe Leu Glu Ala Phe Val  
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 515 520 525  
 His Ala Ser Ala Ala Glu Glu Glu Thr Arg Glu Leu Gln Ser Leu Ala  
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 545 550 555 560  
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 Glu Val Leu Cys Arg Trp Ile Leu Ser Val Lys Lys Asn Tyr Arg Lys  
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 Asn Val Ala Tyr His Asn Trp Arg His Ala Phe Asn Thr Ala Gln Cys  
 610 615 620  
 Met Phe Ala Ala Leu Lys Ala Gly Lys Ile Gln Asn Lys Leu Thr Asp  
 625 630 635 640  
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 His Arg Gly Val Asn Asn Ser Tyr Ile Gln Arg Ser Glu His Pro Leu  
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 Ala Gln Leu Tyr Cys His Ser Ile Met Glu His His His Phe Asp Gln  
 675 680 685  
 Cys Leu Met Ile Leu Asn Ser Pro Gly Asn Gln Ile Leu Ser Gly Leu  
 690 695 700  
 Ser Ile Glu Glu Tyr Lys Thr Thr Leu Lys Ile Ile Lys Gln Ala Ile  
 705 710 715 720  
 Leu Ala Thr Asp Leu Ala Leu Tyr Ile Lys Arg Arg Gly Glu Phe Phe  
 725 730 735  
 Glu Leu Ile Arg Lys Asn Gln Phe Asn Leu Glu Asp Pro His Gln Lys  
 740 745 750  
 Glu Leu Phe Leu Ala Met Leu Met Thr Ala Cys Asp Leu Ser Ala Ile  
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Thr Lys Pro Trp Pro Ile Gln Gln Arg Ile Ala Glu Leu Val Ala Thr  
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 Glu Phe Phe Asp Gln Gly Asp Arg Glu Arg Lys Glu Leu Asn Ile Glu  
 785 790 795 800  
 Pro Thr Asp Leu Met Asn Arg Glu Lys Lys Asn Lys Ile Pro Ser Met  
 805 810 815  
 Gln Val Gly Phe Ile Asp Ala Ile Cys Leu Gln Leu Tyr Glu Ala Leu  
 820 825 830  
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<212> DNA

<213> Homo sapiens

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ggcagcagcg acagcagcag cagccccagc agcagaagca gcagcagagg gatcaggact 240
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<213> Artificial Sequence

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<220>
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<210> 4
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<212> DNA
<213> Artificial Sequence

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<220>
<223> Description of Artificial Sequence: Primer

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<400> 4
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<210> 5
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<212> DNA
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<220>
<223> Description of Artificial Sequence: Pet15S construct

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 Met Gly Ser  
 1  
 agc cat cat cat cat cat cac agc agc ggc ctg gtg ccg cgc ggc agc 164  
 Ser His His His His His His Ser Ser Gly Leu Val Pro Arg Gly Ser  
 5 10 15  
 cat atg ggatccggaa ttcaaaggcc tacgtcgact agagcctgca gtctcgacca 220  
 His Met  
 20  
 tcatcatcat catcattaat aaaagggcga attccagcac actggcggcc gttactagtg 280  
 gatccggctg ctaacaaagc ccgaaaggaa gctgagttgg ctgctgccac cgctgagcaa 340  
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<210> 6  
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 <213> Artificial Sequence

<220>  
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 Arg Gly Ser His Met  
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<210> 7  
 <211> 6  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: 6-His tag

<400> 7  
 His His His His His His  
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<210> 8  
 <211> 366  
 <212> PRT  
 <213> Homo sapiens

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           20                  25                  30  
 Ser Leu Ala Ala Ala Val Val Pro Ser Ala Gln Thr Leu Lys Ile Thr  
           35                  40                  45  
 Asp Phe Ser Phe Ser Asp Phe Glu Leu Ser Asp Leu Glu Thr Ala Leu  
   50                  55                  60  
 Cys Thr Ile Arg Met Phe Thr Asp Leu Asn Leu Val Gln Asn Phe Gln  
   65                  70                  75                  80  
 Met Lys His Glu Val Leu Cys Arg Trp Ile Leu Ser Val Lys Lys Asn  
           85                  90                  95  
 Tyr Arg Lys Asn Val Ala Tyr His Asn Trp Arg His Ala Phe Asn Thr  
          100                 105                 110  
 Ala Gln Cys Met Phe Ala Ala Leu Lys Ala Gly Lys Ile Gln Asn Lys  
          115                 120                 125  
 Leu Thr Asp Leu Glu Ile Leu Ala Leu Leu Ile Ala Ala Leu Ser His  
  130                 135                 140  
 Asp Leu Asp His Arg Gly Val Asn Asn Ser Tyr Ile Gln Arg Ser Glu  
 145                 150                 155                 160  
 His Pro Leu Ala Gln Leu Tyr Cys His Ser Ile Met Glu His His His  
          165                 170                 175  
 Phe Asp Gln Cys Leu Met Ile Leu Asn Ser Pro Gly Asn Gln Ile Leu  
          180                 185                 190  
 Ser Gly Leu Ser Ile Glu Glu Tyr Lys Thr Thr Leu Lys Ile Ile Lys  
  195                 200                 205  
 Gln Ala Ile Leu Ala Thr Asp Leu Ala Leu Tyr Ile Lys Arg Arg Gly  
  210                 215                 220  
 Glu Phe Phe Glu Leu Ile Arg Lys Asn Gln Phe Asn Leu Glu Asp Pro  
 225                 230                 235                 240  
 His Gln Lys Glu Leu Phe Leu Ala Met Leu Met Thr Ala Cys Asp Leu  
          245                 250                 255  
 Ser Ala Ile Thr Lys Pro Trp Pro Ile Gln Gln Arg Ile Ala Glu Leu  
  260                 265                 270

Val Ala Thr Glu Phe Phe Asp Gln Gly Asp Arg Glu Arg Lys Glu Leu  
 275 280 285

Asn Ile Glu Pro Thr Asp Leu Met Asn Arg Glu Lys Lys Asn Lys Ile  
 290 295 300

Pro Ser Met Gln Val Gly Phe Ile Asp Ala Ile Cys Leu Gln Leu Tyr  
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Glu Ala Leu Thr His Val Ser Glu Asp Cys Phe Pro Leu Leu Asp Gly  
 325 330 335

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<211> 1185

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Pet15s construct

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tgatctggaa acagcactgt gtacaattcg gatgtttact gacctcaacc ttgtgcagaa 240
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<210> 10

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<212> PRT

<213> Homo sapiens



&lt;400&gt; 10

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| Leu | Asn | Asn | Thr | Ser | Ile | Ser | Arg | Phe | Gly | Val | Asn | Thr | Glu | Asn | Glu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Asp | His | Leu | Ala | Lys | Glu | Leu | Glu | Asp | Leu | Asn | Lys | Trp | Gly | Leu | Asn |
|     |     | 20  |     |     |     |     | 25  |     |     |     |     |     | 30  |     |     |
| Ile | Phe | Asn | Val | Ala | Gly | Tyr | Ser | His | Asn | Arg | Pro | Leu | Thr | Cys | Ile |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Met | Tyr | Ala | Ile | Phe | Gln | Glu | Arg | Asp | Leu | Leu | Lys | Thr | Phe | Arg | Ile |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Ser | Ser | Asp | Thr | Phe | Ile | Thr | Tyr | Met | Met | Thr | Leu | Glu | Asp | His | Tyr |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| His | Ser | Asp | Val | Ala | Tyr | His | Asn | Ser | Leu | His | Ala | Ala | Asp | Val | Ala |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Gln | Ser | Thr | His | Val | Leu | Leu | Ser | Thr | Pro | Ala | Leu | Asp | Ala | Val | Phe |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Thr | Asp | Leu | Glu | Ile | Leu | Ala | Ala | Ile | Phe | Ala | Ala | Ala | Ile | His | Asp |
|     | 115 |     |     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |
| Val | Asp | His | Pro | Gly | Val | Ser | Asn | Gln | Phe | Leu | Ile | Asn | Thr | Asn | Ser |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Glu | Leu | Ala | Leu | Met | Tyr | Asn | Asp | Glu | Ser | Val | Leu | Glu | Asn | His | His |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Leu | Ala | Val | Gly | Phe | Lys | Leu | Leu | Gln | Glu | Glu | His | Cys | Asp | Ile | Phe |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Met | Asn | Leu | Thr | Lys | Lys | Gln | Arg | Gln | Thr | Leu | Arg | Lys | Met | Val | Ile |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Asp | Met | Val | Leu | Ala | Thr | Asp | Met | Ser | Lys | His | Met | Ser | Leu | Leu | Ala |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Asp | Leu | Lys | Thr | Met | Val | Glu | Thr | Lys | Lys | Val | Thr | Ser | Ser | Gly | Val |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Leu | Leu | Leu | Asp | Asn | Tyr | Thr | Asp | Arg | Ile | Gln | Val | Leu | Arg | Asn | Met |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Val | His | Cys | Ala | Asp | Leu | Ser | Asn | Pro | Thr | Lys | Ser | Leu | Glu | Leu | Tyr |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Arg | Gln | Trp | Thr | Asp | Arg | Ile | Met | Glu | Glu | Phe | Phe | Gln | Gln | Gly | Asp |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Lys | Glu | Arg | Glu | Arg | Gly | Met | Glu | Ile | Ser | Pro | Met | Cys | Asp | Lys | His |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Thr | Ala | Ser | Val | Glu | Lys | Ser | Gln | Val | Gly | Phe | Ile | Asp | Tyr | Ile | Val |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |

His Pro Leu Trp Glu Thr Trp Ala Asp Leu Val Gln Pro Asp Ala Gln  
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Asp Ile Leu Asp Thr Leu Glu Asp Asn Arg Asn Trp Tyr Gln Ser Met  
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Ile Pro Gln Ser Pro  
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<210> 11  
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 Ala Gly Tyr Ser His Asn Arg Pro Leu Thr Cys Ile Met Tyr Ala Ile  
 35 40 45  
 Phe Gln Glu Arg Asp Leu Leu Lys Thr Phe Arg Ile Ser Ser Asp Thr  
 50 55 60  
 Phe Ile Thr Tyr Met Met Thr Leu Glu Asp His Tyr His Ser Asp Val  
 65 70 75 80  
 Ala Tyr His Asn Ser Leu His Ala Ala Asp Val Ala Gln Ser Thr His  
 85 90 95  
 Val Leu Leu Ser Thr Pro Ala Leu Asp Ala Val Phe Thr Asp Leu Glu  
 100 105 110  
 Ile Leu Ala Ala Ile Phe Ala Ala Ala Ile His Asp Val Asp His Pro  
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 Gly Val Ser Asn Gln Phe Leu Ile Asn Thr Asn Ser Glu Leu Ala Leu  
 130 135 140  
 Met Tyr Asn Asp Glu Ser Val Leu Glu Asn His His Leu Ala Val Gly  
 145 150 155 160  
 Phe Lys Leu Leu Gln Glu Glu His Cys Asp Ile Phe Met Asn Leu Thr  
 165 170 175  
 Lys Lys Gln Arg Gln Thr Leu Arg Lys Met Val Ile Asp Met Val Leu  
 180 185 190  
 Ala Thr Asp Met Ser Lys His Met Ser Leu Leu Ala Asp Leu Lys Thr  
 195 200 205

Met Val Glu Thr Lys Lys Val Thr Ser Ser Gly Val Leu Leu Leu Asp  
 210 215 220  
 Asn Tyr Thr Asp Arg Ile Gln Val Leu Arg Asn Met Val His Cys Ala  
 225 230 235 240  
 Asp Leu Ser Asn Pro Thr Lys Ser Leu Glu Leu Tyr Arg Gln Trp Thr  
 245 250 255  
 Asp Arg Ile Met Glu Glu Phe Phe Gln Gln Gly Asp Lys Glu Arg Glu  
 260 265 270  
 Arg Gly Met Glu Ile Ser Pro Met Cys Asp Lys His Thr Ala Ser Val  
 275 280 285  
 Glu Lys Ser Gln Val Gly Phe Ile Asp Tyr Ile Val His Pro Leu Trp  
 290 295 300  
 Glu Thr Trp Ala Asp Leu Val Gln Pro Asp Ala Gln Asp Ile Leu Asp  
 305 310 315 320  
 Thr Leu Glu Asp Asn Arg Asn Trp Tyr Gln Ser Met Ile Pro Gln Ala  
 325 330 335  
 Pro

<210> 12  
 <211> 341  
 <212> PRT  
 <213> Homo sapiens

<400> 12  
 Leu Thr Asn Ser Ser Ile Pro Arg Phe Gly Val Lys Thr Glu Gln Glu  
 1 5 10 15  
 Asp Val Leu Ala Lys Glu Leu Glu Asp Val Asn Lys Trp Gly Leu His  
 20 25 30  
 Val Phe Arg Ile Ala Glu Leu Ser Gly Asn Arg Pro Leu Thr Val Ile  
 35 40 45  
 Met His Thr Ile Phe Gln Glu Arg Asp Leu Leu Lys Thr Phe Lys Ile  
 50 55 60  
 Pro Val Asp Thr Leu Ile Thr Tyr Leu Met Thr Leu Glu Asp His Tyr  
 65 70 75 80  
 His Ala Asp Val Ala Tyr His Asn Asn Ile His Ala Ala Asp Val Val  
 85 90 95  
 Gln Ser Thr His Val Leu Leu Ser Thr Pro Ala Leu Glu Ala Val Phe  
 100 105 110  
 Thr Asp Leu Glu Ile Leu Ala Ala Ile Phe Ala Ser Ala Ile His Asp  
 115 120 125

Val Asp His Pro Gly Val Ser Asn Gln Phe Leu Ile Asn Thr Asn Ser  
 130 135 140  
 Glu Leu Ala Leu Met Tyr Asn Asp Ser Ser Val Leu Glu Asn His His  
 145 150 155 160  
 Leu Ala Val Gly Phe Lys Leu Leu Gln Glu Glu Asn Cys Asp Ile Phe  
 165 170 175  
 Gln Asn Leu Thr Lys Lys Gln Arg Gln Ser Leu Arg Lys Met Val Ile  
 180 185 190  
 Asp Ile Val Leu Ala Thr Asp Met Ser Lys His Met Asn Leu Leu Ala  
 195 200 205  
 Asp Leu Lys Thr Met Val Glu Thr Lys Lys Val Thr Ser Ser Gly Val  
 210 215 220  
 Leu Leu Leu Asp Asn Tyr Ser Asp Arg Ile Gln Val Leu Gln Asn Met  
 225 230 235 240  
 Val His Cys Ala Asp Leu Ser Asn Pro Thr Lys Pro Leu Gln Leu Tyr  
 245 250 255  
 Arg Gln Trp Thr Asp Arg Ile Met Glu Glu Phe Phe Pro Gln Gly Asp  
 260 265 270  
 Arg Glu Arg Glu Arg Gly Met Glu Ile Ser Pro Met Cys Asp Lys His  
 275 280 285  
 Asn Ala Ser Val Glu Lys Ser Gln Val Gly Phe Ile Asp Tyr Ile Val  
 290 295 300  
 His Pro Leu Trp Glu Thr Trp Ala Asp Leu Val His Pro Asp Ala Gln  
 305 310 315 320  
 Asp Ile Leu Asp Thr Leu Glu Asp Asn Arg Glu Trp Tyr Gln Ser Thr  
 325 330 335  
 Ile Pro Gln Ser Pro  
 340

<210> 13  
 <211> 341  
 <212> PRT  
 <213> Homo sapiens

<400> 13  
 Leu Asn Asn Ser Asn Ile Pro Arg Phe Gly Val Lys Thr Asp Gln Glu  
 1 5 10 15  
 Glu Leu Leu Ala Gln Glu Leu Glu Asn Leu Asn Lys Trp Gly Leu Asn  
 20 25 30

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Phe | Cys | Val | Ser | Asp | Tyr | Ala | Gly | Gly | Arg | Ser | Leu | Thr | Cys | Ile |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Met | Tyr | Met | Ile | Phe | Gln | Glu | Arg | Asp | Leu | Leu | Lys | Lys | Phe | Arg | Ile |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Pro | Val | Asp | Thr | Met | Val | Thr | Tyr | Met | Leu | Thr | Leu | Glu | Asp | His | Tyr |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| His | Ala | Asp | Val | Ala | Tyr | His | Asn | Ser | Leu | His | Ala | Ala | Asp | Val | Leu |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Gln | Ser | Thr | His | Val | Leu | Leu | Ala | Thr | Pro | Ala | Leu | Asp | Ala | Val | Phe |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Thr | Asp | Leu | Glu | Ile | Leu | Ala | Ala | Leu | Phe | Ala | Ala | Ala | Ile | His | Asp |
|     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |
| Val | Asp | His | Pro | Gly | Val | Ser | Asn | Gln | Phe | Leu | Ile | Asn | Thr | Asn | Ser |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Glu | Leu | Ala | Leu | Met | Tyr | Asn | Asp | Glu | Ser | Val | Leu | Glu | Asn | His | His |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Leu | Ala | Val | Gly | Phe | Lys | Leu | Leu | Gln | Glu | Asp | Asn | Cys | Asp | Ile | Phe |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Gln | Asn | Leu | Ser | Lys | Arg | Gln | Arg | Gln | Ser | Leu | Arg | Lys | Met | Val | Ile |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Asp | Met | Val | Leu | Ala | Thr | Asp | Met | Ser | Lys | His | Met | Thr | Leu | Leu | Ala |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Asp | Leu | Lys | Thr | Met | Val | Glu | Thr | Lys | Lys | Val | Thr | Ser | Ser | Gly | Val |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Leu | Leu | Leu | Asp | Asn | Tyr | Ser | Asp | Arg | Ile | Gln | Val | Leu | Arg | Asn | Met |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Val | His | Cys | Ala | Asp | Leu | Ser | Asn | Pro | Thr | Lys | Pro | Leu | Glu | Leu | Tyr |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Arg | Gln | Trp | Thr | Asp | Arg | Ile | Met | Ala | Glu | Phe | Phe | Gln | Gln | Gly | Asp |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Arg | Glu | Arg | Glu | Arg | Gly | Met | Glu | Ile | Ser | Pro | Met | Cys | Asp | Lys | His |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Thr | Ala | Ser | Val | Glu | Lys | Ser | Gln | Val | Gly | Phe | Ile | Asp | Tyr | Ile | Val |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| His | Pro | Leu | Trp | Glu | Thr | Trp | Ala | Asp | Leu | Val | His | Pro | Asp | Ala | Gln |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Glu | Ile | Leu | Asp | Thr | Leu | Glu | Asp | Asn | Arg | Asp | Trp | Tyr | Tyr | Ser | Ala |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |

Ile Arg Gln Ser Pro  
340

<210> 14  
<211> 341  
<212> PRT  
<213> Homo sapiens

<400> 14  
Leu Ser Ser Ala Thr Val Pro Arg Phe Gly Val Gln Thr Asp Gln Glu  
1 5 10 15  
Glu Gln Leu Ala Lys Asp Val Glu Asp Thr Asn Lys Trp Gly Leu Asp  
20 25 30  
Val Phe Lys Val Ala Glu Leu Ser Gly Asn Arg Pro Leu Thr Ala Ile  
35 40 45  
Ile Phe Ser Ile Phe Gln Glu Arg Asp Leu Leu Lys Thr Phe Gln Ile  
50 55 60  
Pro Ala Asp Thr Leu Ala Thr Tyr Leu Leu Met Leu Glu Gly His Tyr  
65 70 75 80  
His Ala Asn Val Ala Tyr His Asn Ser Leu His Ala Ala Asp Val Ala  
85 90 95  
Gln Ser Thr His Val Leu Leu Ala Thr Pro Ala Leu Glu Ala Val Phe  
100 105 110  
Thr Asp Leu Glu Ile Leu Ala Ala Leu Phe Ala Ser Ala Ile His Asp  
115 120 125  
Val Asp His Pro Gly Val Ser Asn Gln Phe Leu Ile Asn Thr Asn Ser  
130 135 140  
Asp Val Ala Leu Met Tyr Asn Asp Ala Ser Val Leu Glu Asn His His  
145 150 155 160  
Leu Ala Val Gly Phe Lys Leu Leu Gln Ala Glu Asn Cys Asp Ile Phe  
165 170 175  
Gln Asn Leu Ser Ala Lys Gln Arg Leu Ser Leu Arg Arg Met Val Ile  
180 185 190  
Asp Met Val Leu Ala Thr Asp Met Ser Lys His Met Asn Leu Leu Ala  
195 200 205  
Asp Leu Lys Thr Met Val Glu Thr Lys Lys Val Thr Ser Leu Gly Val  
210 215 220  
Leu Leu Leu Asp Asn Tyr Ser Asp Arg Ile Gln Val Leu Gln Asn Leu  
225 230 235 240  
Val His Cys Ala Asp Leu Ser Asn Pro Thr Lys Pro Leu Pro Leu Tyr  
245 250 255

Arg Gln Trp Thr Asp Arg Ile Met Ala Glu Phe Phe Gln Gln Gly Asp  
 260 265 270

Arg Glu Arg Glu Ser Gly Leu Asp Ile Ser Pro Met Cys Asp Lys His  
 275 280 285

Thr Ala Ser Val Glu Lys Ser Gln Val Gly Phe Ile Asp Tyr Ile Ala  
 290 295 300

His Pro Leu Trp Glu Thr Trp Ala Asp Leu Val His Pro Asp Ala Gln  
 305 310 315 320

Asp Leu Leu Asp Thr Leu Glu Asp Asn Arg Glu Trp Tyr Gln Ser Lys  
 325 330 335

Ile Pro Arg Ser Pro  
 340

<210> 15  
 <211> 392  
 <212> PRT  
 <213> Homo sapiens

<400> 15  
 Glu Arg Met Tyr Arg Lys Thr Tyr His Met Val Gly Leu Ala Tyr Pro  
 1 5 10 15

Ala Ala Val Ile Val Thr Leu Lys Asp Val Asp Lys Trp Ser Phe Asp  
 20 25 30

Val Phe Ala Leu Asn Glu Ala Ser Gly Glu His Ser Leu Lys Phe Met  
 35 40 45

Ile Tyr Glu Leu Phe Thr Arg Tyr Asp Leu Ile Asn Arg Phe Lys Ile  
 50 55 60

Pro Val Ser Cys Leu Ile Thr Phe Ala Glu Ala Leu Glu Val Gly Tyr  
 65 70 75 80

Ser Lys Tyr Lys Asn Pro Tyr His Asn Leu Ile His Ala Ala Asp Val  
 85 90 95

Thr Gln Thr Val His Tyr Ile Met Leu His Thr Gly Ile Met His Trp  
 100 105 110

Leu Thr Glu Leu Glu Ile Leu Ala Met Val Phe Ala Ala Ala Ile His  
 115 120 125

Asp Tyr Glu His Thr Gly Thr Thr Asn Asn Phe His Ile Gln Thr Arg  
 130 135 140

Ser Asp Val Ala Ile Leu Tyr Asn Asp Arg Ser Val Leu Glu Asn His  
 145 150 155 160

His Val Ser Ala Ala Tyr Arg Leu Met Gln Glu Glu Glu Met Asn Ile  
 165 170 175  
 Leu Ile Asn Leu Ser Lys Asp Asp Trp Arg Asp Leu Arg Asn Leu Val  
 180 185 190  
 Ile Glu Met Val Leu Ser Thr Asp Met Ser Gly His Phe Gln Gln Ile  
 195 200 205  
 Lys Asn Ile Arg Asn Ser Leu Gln Gln Pro Glu Gly Ile Asp Arg Ala  
 210 215 220  
 Lys Thr Met Ser Leu Ile Leu His Ala Ala Asp Ile Ser His Pro Ala  
 225 230 235 240  
 Lys Ser Trp Lys Leu His Tyr Arg Trp Thr Met Ala Leu Met Glu Glu  
 245 250 255  
 Phe Phe Leu Gln Gly Asp Lys Glu Ala Glu Leu Gly Leu Pro Phe Ser  
 260 265 270  
 Pro Leu Cys Asp Arg Lys Ser Thr Met Val Ala Gln Ser Gln Ile Gly  
 275 280 285  
 Phe Ile Asp Phe Ile Val Glu Pro Thr Phe Ser Leu Leu Thr Asp Ser  
 290 295 300  
 Thr Glu Lys Ile Val Ile Pro Leu Ile Glu Glu Ala Ser Lys Ala Glu  
 305 310 315 320  
 Thr Ser Ser Tyr Val Ala Ser Ser Ser Thr Thr Ile Val Gly Leu His  
 325 330 335  
 Ile Ala Asp Ala Leu Arg Arg Ser Asn Thr Lys Gly Ser Met Ser Asp  
 340 345 350  
 Gly Ser Tyr Ser Pro Asp Tyr Ser Leu Ala Ala Val Asp Leu Lys Ser  
 355 360 365  
 Phe Lys Asn Asn Leu Val Asp Ile Ile Gln Gln Asn Lys Glu Arg Trp  
 370 375 380  
 Lys Glu Leu Ala Ala Gln Arg Ala  
 385 390

&lt;210&gt; 16

&lt;211&gt; 389

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 16

Glu Arg Met Tyr Arg Arg Thr Ser Asn Met Val Gly Leu Ser Tyr Pro  
 1 5 10 15

Pro Ala Val Ile Glu Ala Leu Lys Asp Val Asp Lys Trp Ser Phe Asp  
 20 25 30



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Phe | Ser | Leu | Asn | Glu | Ala | Ser | Gly | Asp | His | Ala | Leu | Lys | Phe | Ile |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Phe | Tyr | Glu | Leu | Leu | Thr | Arg | Tyr | Asp | Leu | Ile | Ser | Arg | Phe | Lys | Ile |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Pro | Ile | Ser | Ala | Leu | Val | Ser | Phe | Val | Glu | Ala | Leu | Glu | Val | Gly | Tyr |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Ser | Lys | His | Lys | Asn | Pro | Tyr | His | Asn | Leu | Met | His | Ala | Ala | Asp | Val |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Thr | Gln | Thr | Val | His | Tyr | Leu | Leu | Tyr | Lys | Thr | Gly | Val | Ala | Asn | Trp |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Leu | Thr | Glu | Leu | Glu | Ile | Phe | Ala | Ile | Ile | Phe | Ser | Ala | Ala | Ile | His |
|     |     | 115 |     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |
| Asp | Tyr | Glu | His | Thr | Gly | Thr | Thr | Asn | Asn | Phe | His | Ile | Gln | Thr | Arg |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Ser | Asp | Pro | Ala | Ile | Leu | Tyr | Asn | Asp | Arg | Ser | Val | Leu | Glu | Asn | His |
|     | 145 |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| His | Leu | Ser | Ala | Ala | Tyr | Arg | Leu | Leu | Gln | Asp | Asp | Glu | Glu | Met | Asn |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ile | Leu | Ile | Asn | Leu | Ser | Lys | Asp | Asp | Trp | Arg | Glu | Phe | Arg | Thr | Leu |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Val | Ile | Glu | Met | Val | Met | Ala | Thr | Asp | Met | Ser | Cys | His | Phe | Gln | Gln |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ile | Lys | Ala | Met | Lys | Thr | Ala | Leu | Gln | Gln | Pro | Glu | Ala | Ile | Glu | Lys |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Pro | Lys | Ala | Leu | Ser | Leu | Met | Leu | His | Thr | Ala | Asp | Ile | Ser | His | Pro |
|     | 225 |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Ala | Lys | Ala | Trp | Asp | Leu | His | His | Arg | Trp | Thr | Met | Ser | Leu | Leu | Glu |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Glu | Phe | Phe | Arg | Gln | Gly | Asp | Arg | Glu | Ala | Glu | Leu | Gly | Leu | Pro | Phe |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Ser | Pro | Leu | Cys | Asp | Arg | Lys | Ser | Thr | Met | Val | Ala | Gln | Ser | Gln | Val |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Gly | Phe | Ile | Asp | Phe | Ile | Val | Glu | Pro | Thr | Phe | Thr | Val | Leu | Thr | Asp |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Met | Thr | Glu | Lys | Ile | Val | Ser | Pro | Leu | Ile | Asp | Glu | Thr | Ser | Gln | Thr |
|     | 305 |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Gly | Gly | Thr | Gly | Gln | Arg | Arg | Ser | Ser | Leu | Asn | Ser | Ile | Ser | Ser | Ser |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |

Asp Ala Lys Arg Ser Gly Val Lys Thr Ser Gly Ser Glu Gly Ser Ala  
 340 345 350

Pro Ile Asn Asn Ser Val Ile Ser Val Asp Tyr Lys Ser Phe Lys Ala  
 355 360 365

Thr Trp Thr Glu Val Val His Ile Asn Arg Glu Arg Trp Arg Ala Lys  
 370 375 380

Val Pro Lys Glu Glu  
 385

<210> 17

<211> 369

<212> PRT

<213> Homo sapiens

<400> 17

Glu Arg Met Phe Arg Arg Thr Tyr Thr Ser Val Gly Pro Thr Tyr Ser  
 1 5 10 15

Thr Ala Val Leu Asn Cys Leu Lys Asn Leu Asp Leu Trp Cys Phe Asp  
 20 25 30

Val Phe Ser Leu Asn Gln Ala Ala Asp Asp His Ala Leu Arg Thr Ile  
 35 40 45

Val Phe Glu Leu Leu Thr Arg His Asn Leu Ile Ser Arg Phe Lys Ile  
 50 55 60

Pro Thr Val Phe Leu Met Ser Phe Leu Asp Ala Leu Glu Thr Gly Tyr  
 65 70 75 80

Gly Lys Tyr Lys Asn Pro Tyr His Asn Gln Ile His Ala Ala Asp Val  
 85 90 95

Thr Gln Thr Val His Cys Phe Leu Leu Arg Thr Gly Met Val His Cys  
 100 105 110

Leu Ser Glu Ile Glu Leu Leu Ala Ile Ile Phe Ala Ala Ala Ile His  
 115 120 125

Asp Tyr Glu His Thr Gly Thr Thr Asn Ser Phe His Ile Gln Thr Lys  
 130 135 140

Ser Glu Cys Ala Ile Val Tyr Asn Asp Arg Ser Val Leu Glu Asn His  
 145 150 155 160

His Ile Ser Ser Val Phe Arg Leu Met Gln Asp Asp Glu Met Asn Ile  
 165 170 175

Phe Ile Asn Leu Thr Lys Asp Glu Phe Val Glu Leu Arg Ala Leu Val  
 180 185 190

Ile Glu Met Val Leu Ala Thr Asp Met Ser Cys His Phe Gln Gln Val  
 195 200 205  
 Lys Thr Met Lys Thr Ala Leu Gln Gln Leu Glu Arg Ile Asp Lys Pro  
 210 215 220  
 Lys Ala Leu Ser Leu Leu Leu His Ala Ala Asp Ile Ser His Pro Thr  
 225 230 235 240  
 Lys Gln Trp Leu Val His Ser Arg Trp Thr Lys Ala Leu Met Glu Glu  
 245 250 255  
 Phe Phe Arg Gln Gly Asp Lys Glu Ala Glu Leu Gly Leu Pro Phe Ser  
 260 265 270  
 Pro Leu Cys Asp Arg Thr Ser Thr Leu Val Ala Gln Ser Gln Ile Gly  
 275 280 285  
 Phe Ile Asp Phe Ile Val Glu Pro Thr Phe Ser Val Leu Thr Asp Val  
 290 295 300  
 Ala Glu Lys Ser Val Gln Pro Leu Ala Asp Glu Asp Ser Lys Ser Lys  
 305 310 315 320  
 Asn Gln Pro Ser Phe Gln Trp Arg Gln Pro Ser Leu Asp Val Glu Val  
 325 330 335  
 Gly Asp Pro Asn Pro Asp Val Val Ser Phe Arg Ser Thr Trp Val Lys  
 340 345 350  
 Arg Ile Gln Glu Asn Lys Gln Lys Trp Lys Glu Arg Ala Ala Ser Gly  
 355 360 365

Ile

<210> 18  
 <211> 430  
 <212> PRT  
 <213> Homo sapiens

<400> 18  
 Met Phe Leu Asp Lys Pro Ile Leu Ala Pro Glu Pro Leu Val Met Asp  
 1 5 10 15  
 Asn Leu Asp Ser Ile Met Glu Gln Leu Asn Thr Trp Asn Phe Pro Ile  
 20 25 30  
 Phe Asp Leu Val Glu Asn Ile Gly Arg Lys Cys Gly Arg Ile Leu Ser  
 35 40 45  
 Gln Val Ser Tyr Arg Leu Phe Glu Asp Met Gly Leu Phe Glu Ala Phe  
 50 55 60  
 Lys Ile Pro Ile Arg Glu Phe Met Asn Tyr Phe His Ala Leu Glu Ile  
 65 70 75 80

Gly Tyr Arg Asp Ile Pro Tyr His Asn Arg Ile His Ala Thr Asp Val  
 85 90 95  
 Leu His Ala Val Trp Tyr Leu Thr Thr Gln Pro Ile Pro Gly Leu Ser  
 100 105 110  
 Thr Val Ile Asn Asp His Gly Ser Thr Ser Asp Ser Asp Ser Asp Ser  
 115 120 125  
 Gly Phe Thr His Gly His Met Gly Tyr Val Phe Ser Lys Thr Tyr Asn  
 130 135 140  
 Val Thr Asp Asp Lys Tyr Gly Cys Leu Ser Gly Asn Ile Pro Ala Leu  
 145 150 155 160  
 Glu Leu Met Ala Leu Tyr Val Ala Ala Ala Met His Asp Tyr Asp His  
 165 170 175  
 Pro Gly Arg Thr Asn Ala Phe Leu Val Ala Thr Ser Ala Pro Gln Ala  
 180 185 190  
 Val Leu Tyr Asn Asp Arg Ser Val Leu Glu Asn His His Ala Ala Ala  
 195 200 205  
 Ala Trp Asn Leu Phe Met Ser Arg Pro Glu Tyr Asn Phe Leu Ile Asn  
 210 215 220  
 Leu Asp His Val Glu Phe Lys His Phe Arg Phe Leu Val Ile Glu Ala  
 225 230 235 240  
 Ile Leu Ala Thr Asp Leu Lys Lys His Phe Asp Phe Val Ala Lys Phe  
 245 250 255  
 Asn Gly Lys Val Asn Asp Asp Val Gly Ile Asp Trp Thr Asn Glu Asn  
 260 265 270  
 Asp Arg Leu Leu Val Cys Gln Met Cys Ile Lys Leu Ala Asp Ile Asn  
 275 280 285  
 Gly Pro Ala Lys Cys Lys Glu Leu His Leu Gln Trp Thr Asp Gly Ile  
 290 295 300  
 Val Asn Glu Phe Tyr Glu Gln Gly Asp Glu Glu Ala Ser Leu Gly Leu  
 305 310 315 320  
 Pro Ile Ser Pro Phe Met Asp Arg Ser Ala Pro Gln Leu Ala Asn Leu  
 325 330 335  
 Gln Glu Ser Phe Ile Ser His Ile Val Gly Pro Leu Cys Asn Ser Tyr  
 340 345 350  
 Asp Ser Ala Gly Leu Met Pro Gly Lys Trp Val Glu Asp Ser Asp Glu  
 355 360 365  
 Ser Gly Asp Thr Asp Asp Pro Glu Glu Glu Glu Glu Glu Ala Pro Ala  
 370 375 380

Pro Asn Glu Glu Glu Thr Cys Glu Asn Asn Glu Ser Pro Lys Lys Lys  
385 390 395 400

Thr Phe Lys Arg Arg Lys Ile Tyr Cys Gln Ile Thr Gln His Leu Leu  
405 410 415

Gln Asn His Lys Met Trp Lys Lys Val Ile Glu Glu Glu Gln  
420 425 430

<210> 19

<211> 432

<212> PRT

<213> Homo sapiens

<400> 19

Gln Gln Thr Asn Ile Glu Gln Glu Val Ser Leu Asp Leu Ile Leu Val  
1 5 10 15

Glu Glu Tyr Asp Ser Leu Ile Glu Lys Met Ser Asn Trp Asn Phe Pro  
20 25 30

Ile Phe Glu Leu Val Glu Lys Met Gly Glu Lys Ser Gly Arg Ile Leu  
35 40 45

Ser Gln Val Met Tyr Thr Leu Phe Gln Asp Thr Gly Leu Leu Glu Ile  
50 55 60

Phe Lys Ile Pro Thr Gln Gln Phe Met Asn Tyr Phe Arg Ala Leu Glu  
65 70 75 80

Asn Gly Tyr Arg Asp Ile Pro Tyr His Asn Arg Ile His Ala Thr Asp  
85 90 95

Val Leu His Ala Val Trp Tyr Leu Thr Thr Arg Pro Val Pro Gly Leu  
100 105 110

Gln Gln Ile His Asn Gly Cys Gly Thr Gly Asn Glu Thr Asp Ser Asp  
115 120 125

Gly Arg Ile Asn His Gly Arg Ile Ala Tyr Ile Ser Ser Lys Ser Cys  
130 135 140

Ser Asn Pro Asp Glu Ser Tyr Gly Cys Leu Ser Ser Asn Ile Pro Ala  
145 150 155 160

Leu Glu Leu Met Ala Leu Tyr Val Ala Ala Ala Met His Asp Tyr Asp  
165 170 175

His Pro Gly Arg Thr Asn Ala Phe Leu Val Ala Thr Asn Ala Pro Gln  
180 185 190

Ala Val Leu Tyr Asn Asp Arg Ser Val Leu Glu Asn His His Ala Ala  
195 200 205

Ser Ala Trp Asn Leu Tyr Leu Ser Arg Pro Glu Tyr Asn Phe Leu Leu  
 210 215 220  
 His Leu Asp His Val Glu Phe Lys Arg Phe Arg Phe Leu Val Ile Glu  
 225 230 235 240  
 Ala Ile Leu Ala Thr Asp Leu Lys Lys His Phe Asp Phe Leu Ala Glu  
 245 250 255  
 Phe Asn Ala Lys Ala Asn Asp Val Asn Ser Asn Gly Ile Glu Trp Ser  
 260 265 270  
 Asn Glu Asn Asp Arg Leu Leu Val Cys Gln Val Cys Ile Lys Leu Ala  
 275 280 285  
 Asp Ile Asn Gly Pro Ala Lys Val Arg Asp Leu His Leu Lys Trp Thr  
 290 295 300  
 Glu Gly Ile Val Asn Glu Phe Tyr Glu Gln Gly Asp Glu Glu Ala Asn  
 305 310 315 320  
 Leu Gly Leu Pro Ile Ser Pro Phe Met Asp Arg Ser Ser Pro Gln Leu  
 325 330 335  
 Ala Lys Leu Gln Glu Ser Phe Ile Thr His Ile Val Gly Pro Leu Cys  
 340 345 350  
 Asn Ser Tyr Asp Ala Ala Gly Leu Leu Pro Gly Gln Trp Leu Glu Ala  
 355 360 365  
 Glu Glu Asp Asn Asp Thr Glu Ser Gly Asp Asp Glu Asp Gly Glu Glu  
 370 375 380  
 Leu Asp Thr Glu Asp Glu Glu Met Glu Asn Asn Leu Asn Pro Lys Pro  
 385 390 395 400  
 Pro Arg Arg Lys Ser Arg Arg Arg Ile Phe Cys Gln Leu Met His His  
 405 410 415  
 Leu Thr Glu Asn His Lys Ile Trp Lys Glu Ile Val Glu Glu Glu Glu  
 420 425 430

<210> 20  
 <211> 352  
 <212> PRT  
 <213> Homo sapiens

<400> 20  
 Met Val Ser Ser Asn Ile Ile Thr Pro Ile Ser Leu Asp Asp Val Pro  
 1 5 10 15  
 Pro Arg Ile Ala Arg Ala Met Glu Asn Glu Glu Tyr Trp Asp Phe Asp  
 20 25 30

Ile Phe Glu Leu Glu Ala Ala Thr His Asn Arg Pro Leu Ile Tyr Leu  
 35 40 45  
 Gly Leu Lys Met Phe Ala Arg Phe Gly Ile Cys Glu Phe Leu His Cys  
 50 55 60  
 Ser Glu Ser Thr Leu Arg Ser Trp Leu Gln Ile Ile Glu Ala Asn Tyr  
 65 70 75 80  
 His Ser Ser Asn Pro Tyr His Asn Ser Thr His Ser Ala Asp Val Leu  
 85 90 95  
 His Ala Thr Ala Tyr Phe Leu Ser Lys Glu Arg Ile Lys Glu Thr Leu  
 100 105 110  
 Asp Pro Ile Asp Glu Val Ala Ala Leu Ile Ala Ala Thr Ile His Asp  
 115 120 125  
 Val Asp His Pro Gly Arg Thr Asn Ser Phe Leu Cys Asn Ala Gly Ser  
 130 135 140  
 Glu Leu Ala Ile Leu Tyr Asn Asp Thr Ala Val Leu Glu Ser His His  
 145 150 155 160  
 Ala Ala Leu Ala Phe Gln Leu Thr Thr Gly Asp Asp Lys Cys Asn Ile  
 165 170 175  
 Phe Lys Asn Met Glu Arg Asn Asp Tyr Arg Thr Leu Arg Gln Gly Ile  
 180 185 190  
 Ile Asp Met Val Leu Ala Thr Glu Met Thr Lys His Phe Glu His Val  
 195 200 205  
 Asn Lys Phe Val Asn Ser Ile Asn Lys Pro Leu Ala Thr Leu Glu Glu  
 210 215 220  
 Asn Gly Glu Thr Asp Lys Asn Gln Glu Val Ile Asn Thr Met Leu Arg  
 225 230 235 240  
 Thr Pro Glu Asn Arg Thr Leu Ile Lys Arg Met Leu Ile Lys Cys Ala  
 245 250 255  
 Asp Val Ser Asn Pro Cys Arg Pro Leu Gln Tyr Cys Ile Glu Trp Ala  
 260 265 270  
 Ala Arg Ile Ser Glu Glu Tyr Phe Ser Gln Thr Asp Glu Glu Lys Gln  
 275 280 285  
 Gln Gly Leu Pro Val Val Met Pro Val Phe Asp Arg Asn Thr Cys Ser  
 290 295 300  
 Ile Pro Lys Ser Gln Ile Ser Phe Ile Asp Tyr Phe Ile Thr Asp Met  
 305 310 315 320  
 Phe Asp Ala Trp Asp Ala Phe Val Asp Leu Pro Asp Leu Met Gln His  
 325 330 335

Leu Asp Asn Asn Phe Lys Tyr Trp Lys Gly Leu Asp Glu Met Lys Leu  
                   340                                  345                                  350

<210> 21  
 <211> 341  
 <212> PRT  
 <213> Homo sapiens

<400> 21  
 Met Pro Ile Thr Ile Asn Asp Val Pro Pro Cys Ile Ser Gln Leu Leu  
   1                                  5                                  10                                  15  
 Asp Asn Glu Glu Ser Trp Asp Phe Asn Ile Phe Glu Leu Glu Ala Ile  
                   20                                  25                                  30  
 Thr His Lys Arg Pro Leu Val Tyr Leu Gly Leu Lys Val Phe Ser Arg  
                   35                                  40                                  45  
 Phe Gly Val Cys Glu Phe Leu Asn Cys Ser Glu Thr Thr Leu Arg Ala  
                   50                                  55                                  60  
 Trp Phe Gln Val Ile Glu Ala Asn Tyr His Ser Ser Asn Ala Tyr His  
   65                                  70                                  75                                  80  
 Asn Ser Thr His Ala Ala Asp Val Leu His Ala Thr Ala Phe Phe Leu  
                                   85                                  90                                  95  
 Gly Lys Glu Arg Val Lys Gly Ser Leu Asp Gln Leu Asp Glu Val Ala  
                   100                                  105                                  110  
 Ala Leu Ile Ala Ala Thr Val His Asp Val Asp His Pro Gly Arg Thr  
   115                                  120                                  125  
 Asn Ser Phe Leu Cys Asn Ala Gly Ser Glu Leu Ala Val Leu Tyr Asn  
   130                                  135                                  140  
 Asp Thr Ala Val Leu Glu Ser His His Thr Ala Leu Ala Phe Gln Leu  
   145                                  150                                  155                                  160  
 Thr Val Lys Asp Thr Lys Cys Asn Ile Phe Lys Asn Ile Asp Arg Asn  
                   165                                  170                                  175  
 His Tyr Arg Thr Leu Arg Gln Ala Ile Ile Asp Met Val Leu Ala Thr  
                   180                                  185                                  190  
 Glu Met Thr Lys His Phe Glu His Val Asn Lys Phe Val Asn Ser Ile  
                   195                                  200                                  205  
 Asn Lys Pro Met Ala Ala Glu Ile Glu Gly Ser Asp Cys Glu Cys Asn  
   210                                  215                                  220



Pro Ala Gly Lys Asn Phe Pro Glu Asn Gln Ile Leu Ile Lys Arg Met  
 225 230 235 240  
 Met Ile Lys Cys Ala Asp Val Ala Asn Pro Cys Arg Pro Leu Asp Leu  
 245 250 255  
 Cys Ile Glu Trp Ala Gly Arg Ile Ser Glu Glu Tyr Phe Ala Gln Thr  
 260 265 270  
 Asp Glu Glu Lys Arg Gln Gly Leu Pro Val Val Met Pro Val Phe Asp  
 275 280 285  
 Arg Asn Thr Cys Ser Ile Pro Lys Ser Gln Ile Ser Phe Ile Asp Tyr  
 290 295 300  
 Phe Ile Thr Asp Met Phe Asp Ala Trp Asp Ala Phe Ala His Leu Pro  
 305 310 315 320  
 Ala Leu Met Gln His Leu Ala Asp Asn Tyr Lys His Trp Lys Thr Leu  
 325 330 335  
 Asp Asp Leu Glu Cys  
 340

<210> 22  
 <211> 334  
 <212> PRT  
 <213> Homo sapiens

<400> 22  
 Gly Thr Ala Val Ser Asn Ser Leu Asn Ile Leu Asp Asp Asp Tyr Asn  
 1 5 10 15  
 Gly Gln Ala Lys Cys Met Leu Glu Lys Val Gly Asn Trp Asn Phe Asp  
 20 25 30  
 Ile Phe Leu Phe Asp Arg Leu Thr Asn Gly Asn Ser Leu Val Ser Leu  
 35 40 45  
 Thr Phe His Leu Phe Ser Leu His Gly Leu Ile Glu Tyr Phe His Leu  
 50 55 60  
 Asp Met Met Lys Leu Arg Arg Phe Leu Val Met Ile Gln Glu Asp Tyr  
 65 70 75 80  
 His Ser Gln Asn Pro Tyr His Asn Ala Val His Ala Ala Asp Val Thr  
 85 90 95  
 Gln Ala Met His Cys Tyr Leu Lys Glu Pro Lys Leu Ala Asn Ser Val  
 100 105 110  
 Thr Pro Trp Asp Ile Leu Leu Ser Leu Ile Ala Ala Ala Thr His Asp  
 115 120 125  
 Leu Asp His Pro Gly Val Asn Gln Pro Phe Leu Ile Lys Thr Asn His  
 130 135 140

Tyr Leu Ala Thr Leu Tyr Lys Asn Thr Ser Val Leu Glu Asn His His  
 145 150 155 160  
 Trp Arg Ser Ala Val Gly Leu Leu Arg Glu Ser Gly Leu Phe Ser His  
 165 170 175  
 Leu Pro Leu Glu Ser Arg Gln Gln Met Glu Thr Gln Ile Gly Ala Leu  
 180 185 190  
 Ile Leu Ala Thr Asp Ile Ser Arg Gln Asn Glu Tyr Leu Ser Leu Phe  
 195 200 205  
 Arg Ser His Leu Asp Arg Gly Asp Leu Cys Leu Glu Asp Thr Arg His  
 210 215 220  
 Arg His Leu Val Leu Gln Met Ala Leu Lys Cys Ala Asp Ile Cys Asn  
 225 230 235 240  
 Pro Cys Arg Thr Trp Glu Leu Ser Lys Gln Trp Ser Glu Lys Val Thr  
 245 250 255  
 Glu Glu Phe Phe His Gln Gly Asp Ile Glu Lys Lys Tyr His Leu Gly  
 260 265 270  
 Val Ser Pro Leu Cys Asp Arg His Thr Glu Ser Ile Ala Asn Ile Gln  
 275 280 285  
 Ile Gly Phe Met Thr Tyr Leu Val Glu Pro Leu Phe Thr Glu Trp Ala  
 290 295 300  
 Arg Phe Ser Asn Thr Arg Leu Ser Gln Thr Met Leu Gly His Val Gly  
 305 310 315 320  
 Leu Asn Lys Ala Ser Trp Lys Gly Leu Gln Arg Glu Gln Ser  
 325 330  
  
 <210> 23  
 <211> 335  
 <212> PRT  
 <213> Homo sapiens  
  
 <400> 23  
 Gly Ile Ile Pro Gln Ala Pro Leu His Leu Leu Asp Glu Asp Tyr Leu  
 1 5 10 15  
 Gly Gln Ala Arg His Met Leu Ser Lys Val Gly Met Trp Asp Phe Asp  
 20 25 30  
 Ile Phe Leu Phe Asp Arg Leu Thr Asn Gly Asn Ser Leu Val Thr Leu  
 35 40 45  
 Leu Cys His Leu Phe Asn Thr His Gly Leu Ile His His Phe Lys Leu  
 50 55 60

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Asp Met Val Thr Leu His Arg Phe Leu Val Met Val Gln Glu Asp Tyr
 65                      70                      75                      80

His Ser Gln Asn Pro Tyr His Asn Ala Val His Ala Ala Asp Val Thr
                      85                      90                      95

Gln Ala Met His Cys Tyr Leu Lys Glu Pro Lys Leu Ala Ser Phe Leu
                      100                     105                     110

Thr Pro Leu Asp Ile Met Leu Gly Leu Leu Ala Ala Ala Ala His Asp
                      115                     120                     125

Val Asp His Pro Gly Val Asn Gln Pro Phe Leu Ile Lys Thr Asn His
                      130                     135                     140

His Leu Ala Asn Leu Tyr Gln Asn Met Ser Val Leu Glu Asn His His
145                      150                     155                     160

Trp Arg Ser Thr Ile Gly Met Leu Arg Glu Ser Arg Leu Leu Ala His
                      165                     170                     175

Leu Pro Lys Glu Met Thr Gln Asp Ile Glu Gln Gln Leu Gly Ser Leu
                      180                     185                     190

Ile Leu Ala Thr Asp Ile Asn Arg Gln Asn Glu Phe Leu Thr Arg Leu
                      195                     200                     205

Lys Ala His Leu His Asn Lys Asp Leu Arg Leu Glu Asp Ala Gln Asp
210                      215                     220

Arg His Phe Met Leu Gln Ile Ala Leu Lys Cys Ala Asp Ile Cys Asn
225                      230                     235                     240

Pro Cys Arg Ile Trp Glu Met Ser Lys Gln Trp Ser Glu Arg Val Cys
                      245                     250                     255

Glu Glu Phe Tyr Arg Gln Gly Glu Leu Glu Gln Lys Phe Glu Leu Glu
                      260                     265                     270

Ile Ser Pro Leu Cys Asn Gln Gln Lys Asp Ser Ile Pro Ser Ile Gln
                      275                     280                     285

Ile Gly Phe Met Ser Tyr Ile Val Glu Pro Leu Phe Arg Glu Trp Ala
290                      295                     300

His Phe Thr Gly Asn Ser Thr Leu Ser Glu Asn Met Leu Gly His Leu
305                      310                     315                     320

Ala His Asn Lys Ala Gln Trp Lys Ser Leu Leu Pro Arg Gln His
                      325                     330                     335

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<210> 24

<211> 336

<212> PRT

<213> Homo sapiens

&lt;400&gt; 24

Leu Ser Tyr His Ala Ser Ala Ala Glu Glu Glu Thr Arg Glu Leu Gln  
 1 5 10 15  
 Ser Leu Ala Ala Ala Val Val Pro Ser Ala Gln Thr Leu Lys Ile Thr  
 20 25 30  
 Asp Phe Ser Phe Ser Asp Phe Glu Leu Ser Asp Leu Glu Thr Ala Leu  
 35 40 45  
 Cys Thr Ile Arg Met Phe Thr Asp Leu Asn Leu Val Gln Asn Phe Gln  
 50 55 60  
 Met Lys His Glu Val Leu Cys Arg Trp Ile Leu Ser Val Lys Lys Asn  
 65 70 75 80  
 Tyr Arg Lys Asn Val Ala Tyr His Asn Trp Arg His Ala Phe Asn Thr  
 85 90 95  
 Ala Gln Cys Met Phe Ala Ala Leu Lys Ala Gly Lys Ile Gln Asn Lys  
 100 105 110  
 Leu Thr Asp Leu Glu Ile Leu Ala Leu Leu Ile Ala Ala Leu Ser His  
 115 120 125  
 Asp Leu Asp His Arg Gly Val Asn Asn Ser Tyr Ile Gln Arg Ser Glu  
 130 135 140  
 His Pro Leu Ala Gln Leu Tyr Cys His Ser Ile Met Glu His His His  
 145 150 155 160  
 Phe Asp Gln Cys Leu Met Ile Leu Asn Ser Pro Gly Asn Gln Ile Leu  
 165 170 175  
 Ser Gly Leu Ser Ile Glu Glu Tyr Lys Thr Thr Leu Lys Ile Ile Lys  
 180 185 190  
 Gln Ala Ile Leu Ala Thr Asp Leu Ala Leu Tyr Ile Lys Arg Arg Gly  
 195 200 205  
 Glu Phe Phe Glu Leu Ile Arg Lys Asn Gln Phe Asn Leu Glu Asp Pro  
 210 215 220  
 His Gln Lys Glu Leu Phe Leu Ala Met Leu Met Thr Ala Cys Asp Leu  
 225 230 235 240  
 Ser Ala Ile Thr Lys Pro Trp Pro Ile Gln Gln Arg Ile Ala Glu Leu  
 245 250 255  
 Val Ala Thr Glu Phe Phe Asp Gln Gly Asp Arg Glu Arg Lys Glu Leu  
 260 265 270  
 Asn Ile Glu Pro Thr Asp Leu Met Asn Arg Glu Lys Lys Asn Lys Ile  
 275 280 285  
 Pro Ser Met Gln Val Gly Phe Ile Asp Ala Ile Cys Leu Gln Leu Tyr  
 290 295 300

Glu Ala Leu Thr His Val Ser Glu Asp Cys Phe Pro Leu Leu Asp Gly  
 305 310 315 320

Cys Arg Lys Asn Arg Gln Lys Trp Gln Ala Leu Ala Glu Gln Gln Glu  
 325 330 335

<210> 25

<211> 336

<212> PRT

<213> Homo sapiens

<400> 25

Leu Asp Val Leu Ser Tyr His Ala Thr Cys Ser Lys Ala Glu Val Asp  
 1 5 10 15

Lys Phe Lys Ala Ala Asn Ile Pro Leu Val Ser Glu Leu Ala Ile Asp  
 20 25 30

Asp Ile His Phe Asp Asp Phe Ser Leu Asp Val Asp Ala Met Ile Thr  
 35 40 45

Ala Ala Leu Arg Met Phe Met Glu Leu Gly Met Val Gln Lys Phe Lys  
 50 55 60

Ile Asp Tyr Glu Thr Leu Cys Arg Trp Leu Leu Thr Val Arg Lys Asn  
 65 70 75 80

Tyr Arg Met Val Leu Tyr His Asn Trp Arg His Ala Phe Asn Val Cys  
 85 90 95

Gln Leu Met Phe Ala Met Leu Thr Thr Ala Gly Phe Gln Asp Ile Leu  
 100 105 110

Thr Glu Val Glu Ile Leu Ala Val Ile Val Gly Cys Leu Cys His Asp  
 115 120 125

Leu Asp His Arg Gly Thr Asn Asn Ala Phe Gln Ala Lys Ser Gly Ser  
 130 135 140

Ala Leu Ala Gln Leu Tyr Gly Thr Ser Ala Thr Leu Glu His His His  
 145 150 155 160

Phe Asn His Ala Val Met Ile Leu Gln Ser Glu Gly His Asn Ile Phe  
 165 170 175

Ala Asn Leu Ser Ser Lys Glu Tyr Ser Asp Leu Met Gln Leu Leu Lys  
 180 185 190

Gln Ser Ile Leu Ala Thr Asp Leu Thr Leu Tyr Phe Glu Arg Arg Thr  
 195 200 205

Glu Phe Phe Glu Leu Val Ser Lys Gly Glu Tyr Asp Trp Asn Ile Lys  
     210                    215                    220  
 Asn His Arg Asp Ile Phe Arg Ser Met Leu Met Thr Ala Cys Asp Leu  
 225                    230                    235                    240  
 Gly Ala Val Thr Lys Pro Trp Glu Ile Ser Arg Gln Val Ala Glu Leu  
                     245                    250                    255  
 Val Thr Ser Glu Phe Phe Glu Gln Gly Asp Arg Glu Arg Leu Glu Leu  
                     260                    265                    270  
 Lys Leu Thr Pro Ser Ala Ile Phe Asp Arg Asn Arg Lys Asp Glu Leu  
                     275                    280                    285  
 Pro Arg Leu Gln Leu Glu Trp Ile Asp Ser Ile Cys Met Pro Leu Tyr  
                     290                    295                    300  
 Gln Ala Leu Val Lys Val Asn Val Lys Leu Lys Pro Met Leu Asp Ser  
 305                    310                    315                    320  
 Val Ala Thr Asn Arg Ser Lys Trp Glu Glu Leu His Gln Lys Arg Leu  
                     325                    330                    335

<210> 26  
 <211> 329  
 <212> PRT  
 <213> Homo sapiens

<400> 26  
 Met Glu Lys Leu Ser Tyr His Ser Ile Cys Thr Ser Glu Glu Trp Gln  
     1                    5                    10                    15  
 Gly Leu Met Gln Phe Thr Leu Pro Val Arg Leu Cys Lys Glu Ile Glu  
                     20                    25                    30  
 Leu Phe His Phe Asp Ile Gly Pro Phe Glu Asn Met Trp Pro Gly Ile  
                     35                    40                    45  
 Phe Val Tyr Met Val His Arg Ser Cys Gly Thr Ser Cys Phe Glu Leu  
                     50                    55                    60  
 Glu Lys Leu Cys Arg Phe Ile Met Ser Val Lys Lys Asn Tyr Arg Arg  
     65                    70                    75                    80  
 Val Pro Tyr His Asn Trp Lys His Ala Val Thr Val Ala His Cys Met  
                     85                    90                    95  
 Tyr Ala Ile Leu Gln Asn Asn His Thr Leu Phe Thr Asp Leu Glu Arg  
                     100                    105                    110  
 Lys Gly Leu Leu Ile Ala Cys Leu Cys His Asp Leu Asp His Arg Gly  
                     115                    120                    125

Phe Ser Asn Ser Tyr Leu Gln Lys Phe Asp His Pro Leu Ala Ala Leu  
 130 135 140  
 Tyr Ser Thr Ser Thr Met Glu Gln His His Phe Ser Gln Thr Val Ser  
 145 150 155 160  
 Ile Leu Gln Leu Glu Gly His Asn Ile Phe Ser Thr Leu Ser Ser Ser  
 165 170 175  
 Glu Tyr Glu Gln Val Leu Glu Ile Ile Arg Lys Ala Ile Ile Ala Thr  
 180 185 190  
 Asp Leu Ala Leu Tyr Phe Gly Asn Arg Lys Gln Leu Glu Glu Met Tyr  
 195 200 205  
 Gln Thr Gly Ser Leu Asn Leu Asn Asn Gln Ser His Arg Asp Arg Val  
 210 215 220  
 Ile Gly Leu Met Met Thr Ala Cys Asp Leu Cys Ser Val Thr Lys Leu  
 225 230 235 240  
 Trp Pro Val Thr Lys Leu Thr Ala Asn Asp Ile Tyr Ala Glu Phe Trp  
 245 250 255  
 Ala Glu Gly Asp Glu Met Lys Lys Leu Gly Ile Gln Pro Ile Pro Met  
 260 265 270  
 Met Asp Arg Asp Lys Lys Asp Glu Val Pro Gln Gly Gln Leu Gly Phe  
 275 280 285  
 Tyr Asn Ala Val Ala Ile Pro Cys Tyr Thr Thr Leu Thr Gln Ile Leu  
 290 295 300  
 Pro Pro Thr Glu Pro Leu Leu Lys Ala Cys Arg Asp Asn Leu Ser Gln  
 305 310 315 320  
 Trp Glu Lys Val Ile Arg Gly Glu Glu  
 325

<210> 27  
 <211> 345  
 <212> PRT  
 <213> Homo sapiens

<400> 27  
 Glu Val Tyr Gly Lys Glu Pro Trp Glu Cys Glu Glu Glu Glu Leu Ala  
 1 5 10 15  
 Glu Ile Leu Gln Ala Glu Leu Pro Asp Ala Asp Lys Tyr Glu Ile Asn  
 20 25 30  
 Lys Phe His Phe Ser Asp Leu Pro Leu Thr Glu Leu Glu Leu Val Lys  
 35 40 45

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Gly | Ile | Gln | Met | Tyr | Tyr | Glu | Leu | Lys | Val | Val | Asp | Lys | Phe | His |
| 50  |     |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Ile | Pro | Gln | Glu | Ala | Leu | Val | Arg | Phe | Met | Tyr | Ser | Leu | Ser | Lys | Gly |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Tyr | Arg | Lys | Ile | Thr | Tyr | His | Asn | Trp | Arg | His | Gly | Phe | Asn | Val | Gly |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Gln | Thr | Met | Phe | Ser | Leu | Leu | Val | Thr | Gly | Lys | Leu | Lys | Arg | Tyr | Phe |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Thr | Asp | Leu | Glu | Ala | Leu | Ala | Met | Val | Thr | Ala | Ala | Phe | Cys | His | Asp |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ile | Asp | His | Arg | Gly | Thr | Asn | Asn | Leu | Tyr | Gln | Met | Lys | Ser | Gln | Asn |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Pro | Leu | Ala | Lys | Leu | His | Gly | Ser | Ser | Ile | Leu | Glu | Arg | His | His | Leu |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Glu | Phe | Gly | Lys | Thr | Leu | Leu | Arg | Asp | Glu | Ser | Leu | Asn | Ile | Phe | Gln |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Asn | Leu | Asn | Arg | Arg | Gln | His | Glu | His | Ala | Ile | His | Met | Met | Asp | Ile |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ala | Ile | Ile | Ala | Thr | Asp | Leu | Ala | Leu | Tyr | Phe | Lys | Lys | Arg | Thr | Met |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Phe | Gln | Lys | Ile | Val | Asp | Gln | Ser | Lys | Thr | Tyr | Glu | Ser | Glu | Gln | Glu |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Trp | Thr | Gln | Tyr | Met | Met | Leu | Glu | Gln | Thr | Arg | Lys | Glu | Ile | Val | Met |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Ala | Met | Met | Met | Thr | Ala | Cys | Asp | Leu | Ser | Ala | Ile | Thr | Lys | Pro | Trp |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Glu | Val | Gln | Ser | Gln | Val | Ala | Leu | Leu | Val | Ala | Ala | Glu | Phe | Trp | Glu |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Gln | Gly | Asp | Leu | Glu | Arg | Thr | Val | Leu | Gln | Gln | Asn | Pro | Ile | Pro | Met |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Met | Asp | Arg | Asn | Lys | Ala | Asp | Glu | Leu | Pro | Lys | Leu | Gln | Val | Gly | Phe |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Ile | Asp | Phe | Val | Cys | Thr | Phe | Val | Tyr | Lys | Glu | Phe | Ser | Arg | Phe | His |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Glu | Glu | Ile | Thr | Pro | Met | Leu | Asp | Gly | Ile | Thr | Asn | Asn | Arg | Lys | Glu |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Trp | Lys | Ala | Leu | Ala | Asp | Glu | Tyr | Asp |     |     |     |     |     |     |     |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     |     |     |     |



<210> 28  
 <211> 345  
 <212> PRT  
 <213> Homo sapiens

<400> 28

Ala Arg Leu Gly Lys Glu Pro Ala Asp Cys Asp Glu Asp Glu Leu Gly  
 1 5 10 15

Glu Ile Leu Lys Glu Glu Leu Pro Gly Pro Thr Thr Phe Asp Ile Tyr  
 20 25 30

Glu Phe His Phe Ser Asp Leu Glu Cys Thr Glu Leu Asp Leu Val Lys  
 35 40 45

Cys Gly Ile Gln Met Tyr Tyr Glu Leu Gly Val Val Arg Lys Phe Gln  
 50 55 60

Ile Pro Gln Glu Val Leu Val Arg Phe Leu Phe Ser Ile Ser Lys Gly  
 65 70 75 80

Tyr Arg Arg Ile Thr Tyr His Asn Trp Arg His Gly Phe Asn Val Ala  
 85 90 95

Gln Thr Met Phe Thr Leu Leu Met Thr Gly Lys Leu Lys Ser Tyr Tyr  
 100 105 110

Thr Asp Leu Glu Ala Phe Ala Met Val Thr Ala Gly Leu Cys His Asp  
 115 120 125

Ile Asp His Arg Gly Thr Asn Asn Leu Tyr Gln Met Lys Ser Gln Asn  
 130 135 140

Pro Leu Ala Lys Leu His Gly Ser Ser Ile Leu Glu Arg His His Leu  
 145 150 155 160

Glu Phe Gly Lys Phe Leu Leu Ser Glu Glu Thr Leu Asn Ile Tyr Gln  
 165 170 175

Asn Leu Asn Arg Arg Gln His Glu His Val Ile His Leu Met Asp Ile  
 180 185 190

Ala Ile Ile Ala Thr Asp Leu Ala Leu Tyr Phe Lys Lys Arg Ala Met  
 195 200 205

Phe Gln Lys Ile Val Asp Glu Ser Lys Asn Tyr Gln Asp Lys Lys Ser  
 210 215 220

Trp Val Glu Tyr Leu Ser Leu Glu Thr Thr Arg Lys Glu Ile Val Met  
 225 230 235 240

Ala Met Met Met Thr Ala Cys Asp Leu Ser Ala Ile Thr Lys Pro Trp  
 245 250 255

Glu Val Gln Ser Lys Val Ala Leu Leu Val Ala Ala Glu Phe Trp Glu  
 260 265 270

Gln Gly Asp Leu Glu Arg Thr Val Leu Asp Gln Gln Pro Ile Pro Met  
275 280 285

Met Asp Arg Asn Lys Ala Ala Glu Leu Pro Lys Leu Gln Val Gly Phe  
290 295 300

Ile Asp Phe Val Cys Thr Phe Val Tyr Lys Glu Phe Ser Arg Phe His  
305 310 315 320

Glu Glu Ile Leu Pro Met Phe Asp Arg Leu Gln Asn Asn Arg Lys Glu  
325 330 335

Trp Lys Ala Leu Ala Asp Glu Tyr Glu  
340 345

<210> 29

<211> 345

<212> PRT

<213> Homo sapiens

<400> 29

Lys Leu Asn Val Asp Val Ile Asp Asp Cys Glu Glu Lys Gln Leu Val  
1 5 10 15

Ala Ile Leu Lys Glu Asp Leu Pro Asp Pro Arg Ser Ala Glu Leu Tyr  
20 25 30

Glu Phe Arg Phe Ser Asp Phe Pro Leu Thr Glu His Gly Leu Ile Lys  
35 40 45

Cys Gly Ile Arg Leu Phe Phe Glu Ile Asn Val Val Glu Lys Phe Lys  
50 55 60

Val Pro Val Glu Val Leu Thr Arg Trp Met Tyr Thr Val Arg Lys Gly  
65 70 75 80

Tyr Arg Ala Val Thr Tyr His Asn Trp Gln His Gly Phe Asn Val Gly  
85 90 95

Gln Thr Met Phe Thr Leu Leu Met Thr Gly Arg Leu Lys Lys Tyr Tyr  
100 105 110

Thr Asp Leu Glu Ala Phe Ala Met Leu Ala Ala Ala Phe Cys His Asp  
115 120 125

Ile Asp His Arg Gly Thr Asn Asn Leu Tyr Gln Met Lys Ser Thr Ser  
130 135 140

Pro Leu Ala Arg Leu His Gly Ser Ser Ile Leu Glu Arg His His Leu  
145 150 155 160

Glu Tyr Ser Lys Thr Leu Leu Gln Asp Glu Ser Leu Asn Ile Phe Gln  
165 170 175

Asn Leu Asn Lys Arg Gln Phe Glu Thr Val Ile His Leu Phe Glu Val  
 180 185 190  
 Ala Ile Ile Ala Thr Asp Leu Ala Leu Tyr Phe Lys Lys Arg Thr Met  
 195 200 205  
 Phe Gln Lys Ile Val Asp Ala Cys Glu Gln Met Gln Thr Glu Glu Glu  
 210 215 220  
 Ala Ile Lys Tyr Val Thr Val Asp Pro Thr Lys Lys Glu Ile Ile Met  
 225 230 235 240  
 Ala Met Met Met Thr Ala Cys Asp Leu Ser Ala Ile Thr Lys Pro Trp  
 245 250 255  
 Glu Val Gln Ser Gln Val Ala Leu Met Val Ala Asn Glu Phe Trp Glu  
 260 265 270  
 Gln Gly Asp Leu Glu Arg Thr Val Leu Gln Gln Gln Pro Ile Pro Met  
 275 280 285  
 Met Asp Arg Asn Lys Arg Asp Glu Leu Pro Lys Leu Gln Val Gly Phe  
 290 295 300  
 Ile Asp Phe Val Cys Thr Phe Val Tyr Lys Glu Phe Ser Arg Phe His  
 305 310 315 320  
 Lys Glu Ile Thr Pro Met Leu Ser Gly Leu Gln Asn Asn Arg Val Glu  
 325 330 335  
 Trp Lys Ser Leu Ala Asp Glu Tyr Asp  
 340 345

<210> 30  
 <211> 334  
 <212> PRT  
 <213> Homo sapiens

<400> 30  
 Met Met Met Tyr His Met Lys Val Ser Asp Asp Glu Tyr Thr Lys Leu  
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 Leu His Asp Gly Ile Gln Pro Val Ala Ala Ile Asp Ser Asn Phe Ala  
 20 25 30  
 Ser Phe Thr Tyr Thr Pro Arg Ser Leu Pro Glu Asp Asp Thr Ser Met  
 35 40 45  
 Ala Ile Leu Ser Met Leu Gln Asp Met Asn Phe Ile Asn Asn Tyr Lys  
 50 55 60  
 Ile Asp Cys Pro Thr Leu Ala Arg Phe Cys Leu Met Val Lys Lys Gly  
 65 70 75 80  
 Tyr Arg Asp Pro Pro Tyr His Asn Trp Met His Ala Phe Ser Val Ser  
 85 90 95

His Phe Cys Tyr Leu Leu Tyr Lys Asn Leu Glu Leu Thr Asn Tyr Leu  
 100 105 110  
 Glu Asp Ile Glu Ile Phe Ala Leu Phe Ile Ser Cys Met Cys His Asp  
 115 120 125  
 Leu Asp His Arg Gly Thr Asn Asn Ser Phe Gln Val Ala Ser Lys Ser  
 130 135 140  
 Val Leu Ala Ala Leu Tyr Ser Ser Glu Gly Ser Val Met Glu Arg His  
 145 150 155 160  
 His Phe Ala Gln Ala Ile Ala Ile Leu Asn Thr His Gly Cys Asn Ile  
 165 170 175  
 Phe Asp His Phe Ser Arg Lys Asp Tyr Gln Arg Met Leu Asp Leu Met  
 180 185 190  
 Arg Asp Ile Ile Leu Ala Thr Asp Leu Ala His His Leu Arg Ile Phe  
 195 200 205  
 Lys Asp Leu Gln Lys Met Ala Glu Val Gly Tyr Asp Arg Asn Asn Lys  
 210 215 220  
 Gln His His Arg Leu Leu Leu Cys Leu Leu Met Thr Ser Cys Asp Leu  
 225 230 235 240  
 Ser Asp Gln Thr Lys Gly Trp Lys Thr Thr Arg Lys Ile Ala Glu Leu  
 245 250 255  
 Ile Tyr Lys Glu Phe Phe Ser Gln Gly Asp Leu Glu Lys Ala Met Gly  
 260 265 270  
 Asn Arg Pro Met Glu Met Met Asp Arg Glu Lys Ala Tyr Ile Pro Glu  
 275 280 285  
 Leu Gln Ile Ser Phe Met Glu His Ile Ala Met Pro Ile Tyr Lys Leu  
 290 295 300  
 Leu Gln Asp Leu Phe Pro Lys Ala Ala Glu Leu Tyr Glu Arg Val Ala  
 305 310 315 320  
 Ser Asn Arg Glu His Trp Thr Lys Val Ser His Lys Phe Thr  
 325 330

<210> 31

<211> 333

<212> PRT

<213> Homo sapiens

<400> 31

Ser Phe Leu Asp Asn His Lys Lys Leu Thr Pro Arg Arg Asp Val Pro  
 1 5 10 15

Thr Tyr Pro Lys Tyr Leu Leu Ser Pro Glu Thr Ile Glu Ala Leu Arg  
 20 25 30  
 Lys Pro Thr Phe Asp Val Trp Leu Trp Glu Pro Asn Glu Met Leu Ser  
 35 40 45  
 Cys Leu Glu His Met Tyr His Asp Leu Gly Leu Val Arg Asp Phe Ser  
 50 55 60  
 Ile Asn Pro Val Thr Leu Arg Arg Trp Leu Phe Cys Val His Asp Asn  
 65 70 75 80  
 Tyr Arg Asn Asn Pro Phe His Asn Phe Arg His Cys Phe Cys Val Ala  
 85 90 95  
 Gln Met Met Tyr Ser Met Val Trp Leu Cys Ser Leu Gln Glu Lys Phe  
 100 105 110  
 Ser Gln Thr Asp Ile Leu Ile Leu Met Thr Ala Ala Ile Cys His Asp  
 115 120 125  
 Leu Asp His Pro Gly Tyr Asn Asn Thr Tyr Gln Ile Asn Ala Arg Thr  
 130 135 140  
 Glu Leu Ala Val Arg Tyr Asn Asp Ile Ser Pro Leu Glu Asn His His  
 145 150 155 160  
 Cys Ala Val Ala Phe Gln Ile Leu Ala Glu Pro Glu Cys Asn Ile Phe  
 165 170 175  
 Ser Asn Ile Pro Pro Asp Gly Phe Lys Gln Ile Arg Gln Gly Met Ile  
 180 185 190  
 Thr Leu Ile Leu Ala Thr Asp Met Ala Arg His Ala Glu Ile Met Asp  
 195 200 205  
 Ser Phe Lys Glu Lys Met Glu Asn Phe Asp Tyr Ser Asn Glu Glu His  
 210 215 220  
 Met Thr Leu Leu Lys Met Ile Leu Ile Lys Cys Cys Asp Ile Ser Asn  
 225 230 235 240  
 Glu Val Arg Pro Met Glu Val Ala Glu Pro Trp Val Asp Cys Leu Leu  
 245 250 255  
 Glu Glu Tyr Phe Met Gln Ser Asp Arg Glu Lys Ser Glu Gly Leu Pro  
 260 265 270  
 Val Ala Pro Phe Met Asp Arg Asp Lys Val Thr Lys Ala Thr Ala Gln  
 275 280 285  
 Ile Gly Phe Ile Lys Phe Val Leu Ile Pro Met Phe Glu Thr Val Thr  
 290 295 300  
 Lys Leu Phe Pro Met Val Glu Glu Ile Met Leu Gln Pro Leu Trp Glu  
 305 310 315 320

Ser Arg Asp Arg Tyr Glu Glu Leu Lys Arg Ile Asp Asp  
325 330